Aug. 16, 1966 A. E. STAHL 3,266,610

FREE-PLAY DEVICE FOR COIN-OPERATED ENTERTAINMENT OR AMUSEMENT APPARATUS

Filed Dec. 16, 1964

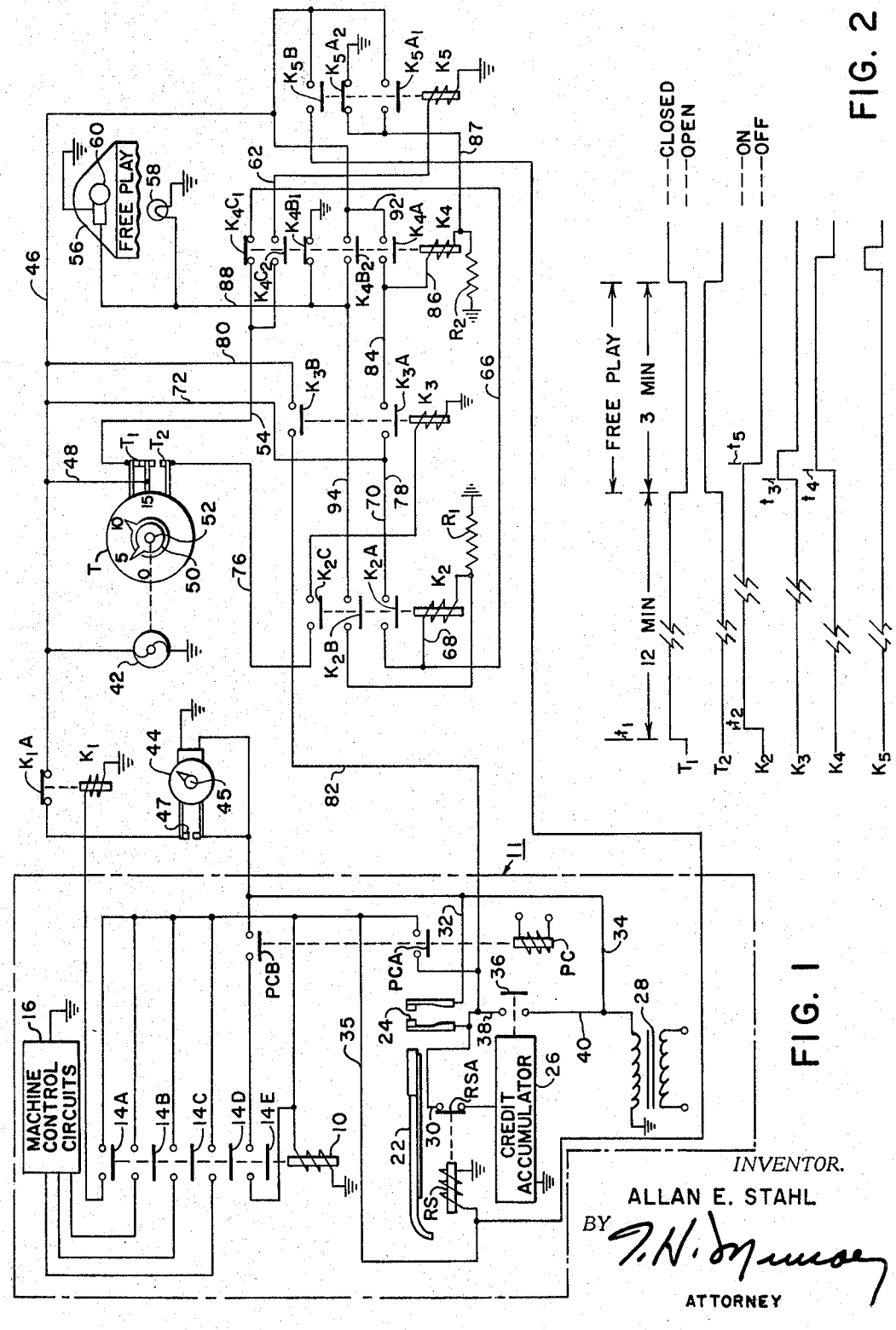



FIG. 1

FIG. 2

INVENTOR.

ALLAN E. STAHL

BY

ATTORNEY

United States Patent Office 3,266,610 Patented August 16, 1966



3,266,610

# FREE-PLAY DEVICE FOR COIN-OPERATED ENTERTAINMENT OR AMUSEMENT APPARATUS

Allan E. Stahl, Youngstown, Ohio, assignor, by mesne assignments, to Walter Soroka, Youngstown, Ohio

Filed Dec. 16, 1964, Ser. No. 418,620
9 Claims. (Cl. 194—1)

The present invention relates to a free-play device which can be incorporated into an entertainment and/or amusement machine, such as a record player or pinball machine, to act as an incentive toward the playing thereof. More particularly, the free-play device of the invention is adapted for use with entertainment and/or amusement and the like machines which are coin-operated.

In the use of coin-operated entertainment and/or amusement machines, it is frequently desirable to call attention to a period of inactivity of such machines in order to provide a legitimate inducement for the public to operate them. Frequently, the machines are installed in locations or business establishments which, because of relatively low levels of lighting, are frequently overlooked by customers who would otherwise desire to play such machines. In other establishments, the amount of customer traffic or general noise level also causes coin-operated machines to be overlooked or forgotten by those members of the public who might otherwise desire to operate them.

The free-play device of the invention can be incorporated with many types of entertainment and/or amusement machines and also with coin-operated vending machines for sales promotion or for advertisement of attendant serivces offered by the business establishment where the machines are located.

The invention presents a reliable free-play device which can be incorporated in, and functions cooperatively with, existing actuating or selectively operated circuits of a variety of such amusement machines. The free-play device of the invention is designed to override and to be overridden by the normal operating circuitry of the machine depending upon how much or how little the machine controlled thereby is utilized.

Briefly, the invention contemplates a unique free-play circuit arrangement which stimulates the public by allowing them to periodically play an entertainment and/or amusement machine free. After a period of time, a credit is placed on the machine in the same manner as if a customer had placed a coin in the machine. A display, in turn, is actuated to appraise the public that such is the case. When a customer plays the machine, the display will be turned off. If, however, a period of time elapses and the machine has not been played, the credit will be removed and the display turned off automatically.

Thus, a free-play or credit is made available for only relatively brief intervals during each cyclic operation of the free-play circuit of the invention, rather than being made continually available until utilized as in circuits of the prior art. In the present invention, it is contemplated that once the free-play circuit is actuated by a lack of normal utilization of the machine, the free-play or credit will be made available for only a minor portion of the period in which the machine is not used. It is also contemplated that the free-play or credit will, however, be made relatively available in accordance with a predetermined and adjustably timed sequence, whose cyclic occurrence is controlled by the free-play circuitry of the invention. The circuit according to the invention is, moreover, arranged to return the operation of the machine to its normal operative circuitry immediately upon actuation by either a free-play customer or a paying customer.



In view of the foregoing, it is an object of the invention to provide a novel and efficient free-play overriding circuit for use with an entertainment and/or amusement machine.

Another object of the invention is the provision of a circuit of the character described in which the free-play or credit is made periodically available in each of a plurality of operating cycles.

A further object of the invention is the provision of a free-play or credit circuit for use with an entertainment and/or amusement device which can immediately override or be overridden by the normal operating circuitry of the device depending upon customer usage thereof.

Still another object of the invention is the provision of a free-play or credit circuit for use with a device of the character described, which is coin-operated. In one arrangement of the invention, a pair of normally closed contacts are connected in electrically series relationship to the free-play or credit circuit of the invention; and circuit means are associated therewith for opening the contacts when one or more latching relays are energized by normal insertion of a coin and operation of the machine in order to deenergize the free-play circuit during normal use of the device.

Another object of the invention is the provision of a free-play or credit circuit in which the free-play or credit is made repetitively available but only at predetermined time intervals.

These and other objects, features and advantages of the invention will become apparent from the following detailed description of the invention taken in connection with the accompanying drawings, in which:

FIGURE 1 is a schematic circuit diagram of one embodiment of the invention; and

FIG. 2 is a timing chart illustrating the cyclical operation of the free-play device of the invention.

Referring now to the drawings, and particularly to FIG. 1, it will be seen that the main actuating relay of an entertainment or amusement machine such as a record player, juke box or shuffle alley is illustrated and indicated by the reference character **10**, the machine itself being diagrammatically shown and enclosed by the broken line **11**. The relay **10**, when actuated, closes a plurality of contacts **14A–14E** which energize necessary circuits **16** of the machine enclosed by broken line **11**, through conductors **18**. One of the aforementioned relay switches **14A** is connected to an auxiliary power relay $K_1$ to open normally closed contacts $K_1A$ thereof in order to interrupt the operation of the free-play or credit circuit in the manner presently to be described.

The machine operating circuitry described thus far can be customer-controlled by a suitable energizing circuit, or selectively operated control means, for example, a coin-operated mechanism including a coin chute **22** and normally open contacts **24** thereof. When properly closed, the contacts **24** connect, in this arrangement, a credit accumulator **26** through conductors **30**, **32** and **34** to a suitable power supply such as transformer **28** for the entertainment or amusement machine **11**. In the usual case, the credit accumulator comprises a stepping switch which is advanced a step each time a coin is inserted in the machine. Each time the machine is played, the stepping switch is retracted. As long as the accumulator **26** has credits stored therein, contacts **36** are closed, permitting the machine to be played. When energized, a holding circuit is provided for the credit accumulator **26** through conductor **40**, normally open contacts **36** of accumulator **26** and conductors **38** and **30**. The machine is now ready for play with contacts **36** being held in closed position.

When the customer initiates playing of the machine, he energizes a player control relay PC by a manual

switch, not shown, thereby closing its normally open contacts PCA and PCB. Closure of contacts PCA retracts the accumulator **26** by connecting the high potential side of the power source **28** to reset relay RS through conductor **35**. At the same time, closure of contacts PCA energizes the main actuating relay **10**. Energization of relay **10** closes its contacts **14E**; and since contacts PCB are now closed, a holding circuit for the relay **10** is provided through contacts **14E** and PCB to the high potential side of the power source **28**. The relay **10** will thus remain energized during the entire time that the machine **11** is played due to continued energization of the player control relay PC. However, at the termination of play, the player control relay PC will become deenergized, whereupon contacts PCA and PCB will open to deenergize the main actuating relay **10** and deenergize the machine circuits **16**.

Upon termination of the normal operating cycle of the entertainment or amusement machine **11**, the free-play or credit circuit of the invention is designed to be energized. In this arrangement of the invention, the free-play or credit circuit comprises, in addition to relay $K_1$ noted previously, a timer T having contacts $T_1$ and $T_2$ and a plurality of relays $K_2$–$K_5$ having relay contacts $K_2A$–$K_2C$, $K_3A$ and $K_3B$, $K_4A$–$K_4C_2$, and $K_5A$ and $K_5B$, respectively. With the exception of relay $K_1$ described generally heretofore, the relays are arranged cooperatively in conjunction with a pair of circuit paths controlled by the timer T and alternately actuated during each cyclic energization of the free-play or credit. Briefly, the normally closed timer contacts $T_1$ control the operation of the free-play circuit during the major portion of its operating cycle, or when a free-play or credit is unavailable, while the normally open timer contacts $T_2$ control the briefer, remaining portion of each cycle when the free-play or credit is made available.

The free-play or credit circuit of the invention is normally energized by connection thereof to the power transformer **28** through a shunt circuit including the conductor **34** and the normally closed contacts $K_1A$ of the relay $K_1$ through which timer motor **42** of the timer T is energized. This energization, however, is interrupted by insertion of a coin into the main actuating circuit of the entertainment and/or amusement machine **11** and attendant energization of relay $K_1$ to open the contacts $K_1A$. The relay $K_1$ is again deenergized, however, upon completion of the play or credit purchased or otherwise procured in the normal manner from the machine **11**. It is contemplated, however, that the entire free-play or credit circuit can be maintained in an inactive condition for a predetermined time after the last purchase from the machine **11** by the optional provision of a delay timer **44** having an adjustment dial **45** in its power circuit path, represented by conductor **34**, to the timer motor **42**. In the event the timer **44** is utilized, the switch **47** is maintained initially in an open condition as shown for a predetermined period depending upon the dial setting of the timer **44**, after which the free-play or credit circuit of the invention is energized through normally closed relay contacts $K_1A$, unless in the meantime, the main actuating circuit of the amusement or entertainment machine **11** is again energized in the normal manner.

The timer contacts $T_1$ and $T_2$, respectively, control a pair of generally parallel circuit paths through the free-play circuit of the invention which, in turn, control the non-availability and availability, respectively, of a free-play or credit during each operating cycle of the free-play circuit. In this arrangement, the contacts $T_1$ are illustrated in the normally closed position inasmuch as they are closed during the major portion, when a free-play or credit is not available, of each cyclic operating interval of the circuit. On the other hand, the timer contacts $T_2$ are shown in a normally open position, as they are closed for only a minor portion of the aforementioned operating interval to make the free-play or credit available during each such interval. One contact of each pair of contacts $T_1$ and $T_2$ is connected to a power bus **46** through lead **48**. The timer T is provided with a pair of adjustment dials **50** and **52**, in a known manner, which control the closure of the contacts $T_1$ and $T_2$. For illustrative purposes, the adjustment dial **50** may be set at about twelve minutes so that the related contacts $T_1$ are closed for about 80% of each operating cycle to make the free-play or credit unavailable during the major portion of each operating cycle. On the other hand, the adjustment dial **52** is set for about three minutes to close the contacts $T_2$ during the minor, remaining portion of each operating cycle during which the free-play or credit is made available. It will be readily apparent, of course, that differing portions of the operating cycle can be selected in which the contacts $T_1$ and $T_2$ are respectively closed and that the operating cycle itself can thus be shortened or lengthened. It will also be readily apparent that actuation of player control relay PC after insertion of a coin to close the switch contacts **24** will immediately deactivate the free-play circuit during any portion of its operating cycle.

The operating of the circuit can be described in connection with a complete operating cycle of the free-play circuit, during which time the cycle is uninterrupted by insertion of a coin and actuation of the player control relay PC and an interrupted cycle of the free-play circuitry; during which time a coin is inserted and the player control relay PC is actuated.

The operation of the free-play circuitry without interruption can best be understood by reference to FIG. 2 where the waveforms illustrate the "ON" and "OFF" or energized and deenergized conditions of relays $K_2$–$K_5$ as well as the closed and open positions of the contacts $T_1$ and $T_2$. The cycle starts at time $t_1$, at which time the contacts $T_1$ are closed, contacts $T_2$ are open, and relays $K_2$–$K_5$ are OFF or deenergized. Upon closure of contacts $T_1$, current is supplied from the power bus **46** through lead **48** and lead **54** to contacts $K_4C_1$ which are now closed due to the fact that the relay $K_4$ is deenergized. The energized lead **54** is, consequently, connected to lead **66** which, through lead **68**, energizes the synchronizing relay $K_2$ at time $t_2$ shown in FIG. 2. Energization of relay $K_2$, in turn, closes its normally open contacts $K_2C$, $K_2B$ and $K_2A$. Closure of contacts $K_2A$ provides a holding circuit for the synchronizing relay $K_2$ through lead **68**, contacts $K_2A$ and leads **70** and **72**. Closure of contacts $K_2B$ connects the upper terminal of resistor $R_1$ through lead **94** and contacts $K_4B_1$ to ground, thereby effectively removing resistor $R_1$ from the circuit. Closure of contacts $K_2C$ at this time, however, has no effect for the reason that contacts $T_2$ are open.

After an elapse of twelve minutes as shown in FIG. 2, the timer T will open contacts $T_1$ and close contacts $T_2$. Closure of contacts $T_2$, in turn, connects the contacts $K_2C$ to the power bus **46** through lead **48**, contacts $T_2$ and lead **76**. The other side of the contacts $K_2C$ is, in turn, connected to the energizing coil for relay $K_3$ through lead **78**. Consequently, the relay $K_3$ will become energized at time $t_3$ shown in FIG. 2. Energization of relay $K_3$, in turn, closes contacts $K_3B$ and $K_3A$. When contacts $K_3B$ close, the power bus **46** is connected through lead **80**, contacts $K_3B$ and lead **82** to the energizing coil for credit accumulator **26**, thereby advancing the accumulator and closing contacts **36**. Thus, the contacts **36** are closed such that the main actuating relay **10** can be actuated by energization of the player control relay PC without insertion of a coin into the coil slot **22** to close contacts **24**.

Closure of contacts $K_3A$ on relay $K_3$ energizes relay $K_4$ through lead **72**, contacts $K_3A$, leads **84**, **86** and **87**, and contacts $K_5A_2$ on relay $K_5$ to ground. Relay $K_5$ is deenergized at this time, and the direct connection to ground through lead **87** effectively disconnects resistor $R_2$ from the circuit. Thus, at time $t_4$ shown in FIG. 2, the relay

$K_4$ becomes energized and will be held energized by virtue of closure of its contacts $K_4A$ which connect the lead **86** through lead **92** to the power bus **46**. At the same time, energization of relay $K_4$ closes contacts $K_4B_2$ and opens contacts $K_4B_1$, thereby removing the ground connection from the upper end of resistor $R_1$. The voltage, being equalized across the coil of relay $K_2$, now causes relay $K_2$ to become deenergized. Thus, at time $t_5$ shown in FIG. 2, the relay $K_2$ becomes deenergized.

When relay $K_4$ became energized at time $t_4$, closure of contacts $K_4B_2$ connected the power bus **46** through lead **92** and lead **88** to lamp **58** and audible alarm **60** in the free-play device **56**. The public is now appraised of the fact that a credit has been placed on the machine and a free-play is available to any customer wishing to operate the machine.

As shown in FIG. 2, the free-play condition is maintained for three minutes, during which time the relay $K_4$ remains energized to maintain the free-play display **56** energized. Assuming that no player wishes to participate during the three-minute interval, contacts $T_2$ will open and contacts $T_1$ close. Consequently, a signal will appear on lead **54**; and assuming that relay $K_4$ is energized due to the fact that the free-play credit was not utilized and the display **56** remained ON, the signal will pass through contacts $K_4C_2$, which are now closed, and lead **62** to relay $K_5$. In this respect, it will be appreciated that the relay $K_5$ is energized if, and only if, the free-play credit is not utilized by a customer. The purpose for this is to reset the credit initially placed on the machine by the free-play device of the invention.

When relay $K_5$ becomes energized, closure of contacts $K_5A_1$ and opening of contacts $K_5A_2$ effectively removes relay $K_4$ from the circuit since the upper side of resistor $R_2$ is now connected to power bus **46**, whereupon the contacts $K_4B_2$ open to deenergize the free-play display **56**. At the same time, closure of contacts $K_5B$ will energize reset relay RS to open normally closed contacts RSA in lead **30**, thereby retracting the credit accumulator **26** and opening contacts **36** to remove the credit previously placed on the machine **11** by a signal on lead **82**. In order to actuate the machine **11**, it is now necessary to again insert a coin into the coin slot **22**.

As will be understood, the foregoing cycle will be repeated, assuming that there is no coin play within the next twelve minutes. If, however, there is coin play within the next twelve minutes, such coin play actuates the relay $K_1$ to stop the timer motor **42**. The time during which contacts $T_1$ are closed now becomes equal to twelve minutes plus the time during which coin play was ensued. During coin play, the relay $K_2$ also drops out by virtue of the fact that power to bus **46** is interrupted. However, at the completion of coin play, power to timer motor **42** and the bus **46** is restored, whereupon the relay $K_2$ again becomes energized and the cycle continues as above, assuming that it is not again interrupted by coin play.

If during the free-play cycle of three minutes shown in FIG. 2, the machine is played by energization of player control relay PC, the relay $K_1$ will become energized, removing power from the free-play device. This deenergizes all of the relays $K_2$–$K_5$ which do not become energized again until the next twelve-minute interval of the free-play device during which a free-play credit is unavailable. That is, once relay $K_4$ becomes deenergized by removal of power from bus **46** during the three-minute free-play interval, it cannot again be energized when the three-minute interval resumes due to the fact that relay $K_2$ cannot again be energized until contacts $T_1$ close. This insures that any customer will obtain only one free-play credit during any fifteen-minute interval.

Although the invention has been shown in connection with a certain specific embodiment, it will be readily apparent to those skilled in the art that various changes in form and arrangement of parts may be made to suit requirements without departing from the spirit and scope of the invention.

I claim as my invention:

**1.** In a coin-operated machine of the type in which a cycle of operation of the machine is normally enabled by depositing a coin in a coin slot or the like; the combination of apparatus for periodically enabling operation of the machine without deposition of a coin in the coin slot, comprising mechanism actuable when the machine is not operative by deposition of a coin in said coin slot for enabling free operation of the machine during spaced first time intervals separated by second time intervals, and means for interrupting either said first or second time interval when a cycle of operation of the machine is initiated.

**2.** In a coin-operated machine of the type in which a cycle of operation of the machine of predetermined duration is normally enabled by depositing a coin in a coin slot or the like; the combination of apparatus for periodically enabling operation of the machine for a predetermined duration without deposition of a coin in the coin slot, comprising mechanism actuable when the machine is not operative by deposition of a coin in said coin slot for enabling free operation of the machine during spaced first time intervals separated by second time intervals, and means for interrupting either said first or second time interval when the machine is operative by virtue of the coin being deposited in said coin slot.

**3.** The combination of claim **2** and including means for preventing free operation of said machine during a first time interval after it has once been operated free during that said first time interval.

**4.** A free-play device for an amusement machine or the like having a power circuit and a main relay controlling said power circuit and selectively operated control means for actuating said main relay, said free-play device comprising a shunt circuit around said main relay, a secondary power relay and timer switch in said shunt circuit, said timer switch having two pairs of power contacts with one contact of each said pairs being connected to said shunt circuit, the remainder of said contacts being connected respectively to generally parallel circuit paths of said free-play device, first relay means connected in one of said paths for energization thereby, said first relay means having a pair of contacts closed thereby and coupled in the other of said paths, second relay means coupled in the other of said paths by connection to said first relay contacts, said second relay means having a pair of contacts controlled by the energization thereof, and said last-mentioned contacts when closed connecting said selectively operated control means of said amusement device to said shunt circuit.

**5.** The combination of claim **4** characterized further in that said secondary power relay has a pair of normally closed contacts in said shunt circuit and is connected to said main relay for energization therewith.

**6.** The combination of claim **4** characterized further in that an adjustably delayed timer switch is connected in said shunt circuit in series with said normally closed contacts of said secondary power relay.

**7.** A free-play circuit for an amusement device and the like having a power circuit energized by a main relay control means and selectively operated mean for controlling the energization of said relay control means, said free-play circuit including a shunt circuit around said power circuit and said main relay, a pair of switch means in said shunt circuit respectively controlling the energization of parallel circuit paths through said free-play circuit, means for alternately energizing said switch means and said circuit paths, latching relay means in one of said circuit paths having contacts operated thereby in the other of said paths, said latching relay contacts being connected to second relay means having contacts coupled to said shunt circuit and to said selectively

operated means to supply a free-play pulse thereto upon alternate operation of said switch means.

8. A free-play circuit for use with an amusement device or the like having a power circuit operated by a main control relay and selectively operated means for actuating said relay, said free-play circuit including a shunt circuit around said power circuit having a secondary power relay and a cyclic timer switch therein, said timer switch having a pair of switching means coupled to said shunt circuit and respectively to a pair of circuit paths through said free-play circuit, a display relay having first normally closed contact means coupled in one of said paths for energizing latch relay means connected in the other of said paths, said display relay having first normally open contact means coupled in said one path and connected to a reset relay when said display relay is energized, said reset relay having a pair of normally open contacts connected across said display relay to cause the latter to be deenergizd upon energization of said reset relay, said display relay having second normally open contact means coupled to a second pair of contacts of said latch relay means, said second contact means and said second pair of contacts being connected across said latch relay means to deenergize the latter when said display relay and said latch relay means are energized at the same time, a free-play relay connected to said first pair of latch relay contacts, said free-play relay having first contact means connected to said selectively operating means of said amusement device to apply a free-play signal thereto, said free-play relay having second contact means for energizing said display relay and for causing said latch relay means to drop out of said circuit path.



9. A free-play device for an amusement machine or the like having a power circuit and a main relay controlling said power circuit and selectively operated control means for actuating said main relay, said free-play device comprising a shunt circuit around said main relay, a secondary power relay and timer switch in said shunt circuit, said timer switch having two pairs of power contacts with one contact of each said pairs being connected to said shunt circuit, the remainder of said contacts being connected respectively to generally parallel circuit paths of said free-play device, first relay means connected in one of said paths for energization thereby, said first relay means having a pair of contacts closed thereby and coupled in the other of said paths, second relay means coupled in the other of said paths by connection to said first relay contacts, said second relay means having a pair of contacts controlled by the energization thereof, said last-mentioned contacts when closed connecting said selectively operated control means of said amusement device to said shunt circuit, said second relay means having an additional pair of contacts actuated thereby, and a relay actuated display device connected through said additional contacts to said shunt circuit.

**References Cited by the Examiner**

UNITED STATES PATENTS

| | | | |
|---|---|---|---|
| 2,102,531 | 12/1937 | Hoke | 194—15 |
| 2,232,925 | 2/1941 | Mills | 194—15 |
| 2,623,621 | 12/1952 | Armor et al. | 194—9 |


RAPHAEL M. LUPO, *Primary Examiner.*

S. H. TOLLBERG, *Assistant Examiner.*